

# Tick Research to Prevent Disease and The Cost Burden of Lyme Disease

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HHS TBDWG 2018 Subcommittee, Member  
NYS TBDWG, Member  
NYS Senator Serino's Advisory Board on Lyme and TBD, Co-chair  
Tick Research to Eliminate Diseases, Coalition of Scientists, coordinator  
Public Integrated Pest Management Work Group, Member  
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Dutchess County Legislative Tick Task Force, Member  
Stop Ticks On People (S.T.O.P.), Board Member  
NYS Coalition on Lyme and Tick-borne Disease, Member

**"What's the problem? Well it's the ticks of course!"**

# **44 YEAR SUMMARY**

**Over forty years of known Lyme disease:**

**Plight of patients not changed**

**No reliable test to determine who is actively infected**

**Tick - numbers dramatically increase**

**Tick - geographic spread**

**\*Multitude of virulent pathogens, discovered.**

**Percentages of all pathogens increase in ticks.**

\*Babesia, Anaplasma, Ehrlichia, Powassan /Deer Tick Virus, Borrelia miyamotoi, Tularemia, Tick paralysis , Bartonella, Bourbon virus, Heartland virus and others.

## WHAT DO WE NEED?

1. **Accurate testing** for active disease.  
Antigen vs Antibody
2. **Treatment cures** for Suffering - Lyme and Co-infection.
3. **Tick Research - reduce tick populations and block tick ability to transmit pathogens.**  
**Environmental tick problem must be addressed.**
4. **Funding** - commensurate with Tick-Borne Diseases
5. **Balanced education** – two standards of care: ILADS and IDSA
6. **Legislation** - Federal and State

# Controversy – Two Standards of Care

**IDSA** Infectious Disease Society of America -

- Lyme disease is easily diagnosed treated and cured with 2-4 weeks of antibiotics.
- Treatment for a tick bite is one double dose of doxycycline.

**ILADS** International Lyme and Associated Diseases Society

- Lyme disease and TBDs can be complicated, diagnosis and treatment are individualized.
- Treatment for a tick bite is 20 days of doxycycline (barring any contraindications).

## Bad news vs Good news

1. Quandary for patients and physicians. Harassment of physicians. Costly and difficult for patients to find treatment.
2. HHS TBD Working Group established in 2017. First report to congress in 2018.
3. Research is providing answers such as:  
Ineffective standard 2 Tiered testing will be replaced. Persistence of Bb. Potential treatments with the full spectrum of FDA antibiotics and much more.

Current laboratory tests for Lyme disease are poor disease indicators; there are **NO diagnostic tests** available for the majority of other diseases caused by tick-borne microbes.

## Deadly Heartland Virus Is Much More Common Than Scientists Thought



It's called the Heartland virus disease. Since it was first detected in 2009, there have been only nine reported cases in the Midwest, including two deaths.

So scientists thought the Heartland virus was limited to a small region.

That assumption was wrong.

A team at the Centers for Disease Control and Prevention has now found signs that Heartland virus is circulating in deer, raccoons, coyotes and moose in 13 states — from Texas to North Carolina and Florida to Maine.

"It was not only in these states, but it was fairly common," says biologist Nick Komar, who led the study. "It's very possible there have been many other cases that have been overlooked."



“The underlying message of this story is there are new pathogens out there. Our society is changing so quickly — and even the climate — that it allows for new things to develop. And we have to be on the lookout for those new things so we can protect the public health.”

Source: <http://www.npr.org/sections/health-shots/2015/09/16/440595392/deadly-heartland-virus-is-much-more-common-than-scientists-thought>

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# Lyme “EM” Rashes



**No Rash in 30% of cases**



**This Classic Bullseye Rash  
Is the least common appearance**



## **EARLY TREATMENT CRITICAL**



### **Would 17 year old Joseph be alive ?**

Prime tick season, prime endemic area, a 2 week outdoor program at Brown University, an otherwise healthy 17 year old boy became ill. Joseph's pediatrician never diagnosed or treated him.

About 3 weeks later, he died of disseminated Lyme disease.

He's in a grave and his parents grieve.

### **An Accurate Lyme Disease Test Would Have Prevented His Death**

**Over 44 Years and still no accurate test**

It's NOT just  
Lyme  
disease: One  
tick bite may  
cause  
multiple  
infections.

Some are  
currently  
untreatable  
... and fatal.

Source: cdc.gov

## Tickborne Diseases of the United States



In the United States, some ticks carry pathogens that can cause human disease, including:

- [Anaplasmosis](#) is transmitted to humans by tick bites primarily from the blacklegged tick (*Ixodes scapularis*) in the northeastern and upper midwestern U.S. and the western blacklegged tick (*Ixodes pacificus*) along the Pacific coast.
- [Babesiosis](#) is caused by microscopic parasites that infect red blood cells. Most human cases of babesiosis in the U.S. are caused by *Babesia microti*. *Babesia microti* is transmitted by the blacklegged tick (*Ixodes scapularis*) and is found primarily in the northeast and upper midwest.
- [Borrelia miyamotoi](#) infection has recently been described as a cause of illness in the U.S. It is transmitted by the blacklegged tick (*Ixodes scapularis*) and has a range similar to that of Lyme disease.
- [Colorado tick fever](#) is caused by a virus transmitted by the Rocky Mountain wood tick (*Dermacentor andersoni*). It occurs in the the Rocky Mountain states at elevations of 4,000 to 10,500 feet.
- [Ehrlichiosis](#) is transmitted to humans by the lone star tick (*Amblyomma americanum*), found primarily in the southcentral and eastern U.S.
- [Heartland virus](#) infection has been identified in eight patients in Missouri and Tennessee as of March 2014. Studies suggest that Lone Star ticks may transmit the virus. It is unknown if the virus may be found in other areas of the U.S.
- [Lyme disease](#) is transmitted by the blacklegged tick (*Ixodes scapularis*) in the northeastern U.S. and upper midwestern U.S. and the western blacklegged tick (*Ixodes pacificus*) along the Pacific coast.
- [Powassan disease](#) is transmitted by the blacklegged tick (*Ixodes scapularis*) and the groundhog tick (*Ixodes cookei*). Cases have been reported primarily from northeastern states and the Great Lakes region.
- [Rickettsia parkeri rickettsiosis](#) is transmitted to humans by the Gulf Coast tick (*Amblyomma maculatum*).
- [Rocky Mountain spotted fever \(RMSF\)](#) is transmitted by the American dog tick (*Dermacentor variabilis*), Rocky Mountain wood tick (*Dermacentor andersoni*), and the brown dog tick (*Rhipicephalus sanguineus*) in the U.S. The brown dog tick and other tick species are associated with RMSF in Central and South America.
- [STARI \(Southern tick-associated rash illness\)](#) is transmitted via bites from the lone star tick (*Amblyomma americanum*), found in the southeastern and eastern U.S.
- [Tickborne relapsing fever \(TBRF\)](#) is transmitted to humans through the bite of infected soft ticks. TBRF has been reported in 15 states: Arizona, California, Colorado, Idaho, Kansas, Montana, Nevada, New Mexico, Ohio, Oklahoma, Oregon, Texas, Utah, Washington, and Wyoming and is associated with sleeping in rustic cabins and vacation homes.
- [Tularemia](#) is transmitted to humans by the dog tick (*Dermacentor variabilis*), the wood tick (*Dermacentor andersoni*), and the lone star tick (*Amblyomma americanum*). Tularemia occurs throughout the U.S.
- [364D rickettsiosis](#) (*Rickettsia phillipi*, proposed) is transmitted to humans by the Pacific Coast tick (*Dermacentor occidentalis* ticks). This is a new disease that has been found in California.



# TICK REMOVAL



## HOW TO REMOVE A TICK

1. Use pointy tweezers to grab it firmly right where the mouthparts enter the skin and pull firmly and steadily upward.
2. Place the tick in a small jar of rubbing alcohol.
3. Disinfect your skin with rubbing alcohol or peroxide.
4. Consider tick testing.

Video: [https://tickencounter.org/prevention/how\\_to\\_remove\\_a\\_tick\\_video](https://tickencounter.org/prevention/how_to_remove_a_tick_video)

## HOW NOT TO REMOVE A TICK

1. Do not use a match, cigarette, Vaseline or any other method.
2. Tick Encounter tested more than a dozen reportedly foolproof methods for tick removal— pointy tweezers that allow you to grab even poppy-seed sized nymphs close to the skin have proven to be the most consistently reliable means for removing all species and stages of ticks safely.

# Preventing Tick Bites on People

Tick exposure can occur year-round, but ticks are most active during warmer months (April-September).

## Before You Go Outdoors

- **Know where to expect ticks.** Ticks live in grassy, brushy, or wooded areas, or even on animals. Spending time outside walking your dog, camping, gardening, or hunting could bring you in close contact with ticks. Many people get ticks in their own yard or neighborhood.
- **Treat clothing and gear** with products containing 0.5% permethrin. Permethrin can be used to treat boots, clothing and camping gear and remain protective through several washings. Alternatively, you can buy permethrin-treated clothing and gear.
  - **Read instructions** – lasts through many washings
  - **Apply to clothing:** shoes, socks, pants, shirts, hats in well ventilated areas
  - **Hang to dry**
- **Use [Environmental Protection Agency \(EPA\)-registered insect repellentsExternal](#)** on your exposed skin containing DEET, picaridin, IR3535, Oil of Lemon Eucalyptus (OLE), para-menthane-diol (PMD), or 2-undecanone. EPA's helpful [search toolExternal](#) can help you find the product that best suits your needs. Always follow product instructions.
  - Do not use insect repellent on babies younger than 2 months old.
  - Do not use products containing OLE or PMD on children under 3 years old.
- **Avoid Contact with Ticks**
  - Avoid wooded and brushy areas with high grass and leaf litter.
  - Walk in the center of trails.

## After You Come Indoors

**Check your clothing for ticks.** Ticks may be carried into the house on clothing. Any ticks that are found should be removed. **Tumble dry clothes** in a dryer on high heat for 10 minutes to kill ticks on dry clothing after you come indoors. If the clothes are damp, additional time may be needed. If washing clothes first use hot water and dry completely with high heat

**Examine gear and pets.** Ticks can ride into the home on clothing and pets, then attach to a person later, so carefully examine pets, coats, and daypacks.

**Shower soon after being outdoors.** Showering within two hours of coming indoors has been shown to reduce your risk of getting Lyme disease and may be effective in reducing the risk of other tickborne diseases. Showering may help wash off unattached ticks and it is a good opportunity to do a tick check.

**Check your body for ticks after being outdoors.** Conduct a full body check upon return from potentially tick-infested areas, including your own backyard. Use a hand-held or full-length mirror to view all parts of your body. Check these parts of your body and your child's body for ticks:

Under the arms

In and around the ears

Inside belly button

Back of the knees

In and around the hair

Between the legs

Around the waist

## Preventing Ticks on Your Pets

Dogs are very susceptible to tick bites and tickborne diseases. Vaccines are not available for most of the tickborne diseases that dogs can get, and they don't keep the dogs from bringing ticks into your home. For these reasons, it's important to use a tick preventive product on your dog.

Tick bites on dogs may be hard to detect. Signs of tickborne disease may not appear for 7-21 days or longer after a tick bite, so watch your dog closely for changes in behavior or appetite if you suspect that your pet has been bitten by a tick.

Talk to your veterinarian about:

- The best tick prevention products for your dog
- Tickborne diseases in your area

To further reduce the chances that a tick bite will make your dog sick:

- Check your pets for ticks daily, especially after they spend time outdoors.
- If you find a tick on your pet, [remove it](#) right away.
- Reduce tick habitat [in your yard](#).

**Note: Cats are extremely sensitive to a variety of chemicals. Do not apply any tick prevention products to your cats without first asking your veterinarian!**

**Note—September 21, 2018:** [FDA Fact Sheet for Pet Owners and VeterinariansExternal](#) about Potential Adverse Events Associated with Isoxazoline Flea and Tick Products. For additional information, please talk to your veterinarian.

# Preventing Ticks in the Yard

## Create a Tick-Safe Zone Through Landscaping

You can make your yard less attractive to ticks depending on how you landscape. Here are some simple landscaping techniques that can help reduce tick populations:

- Clear tall grasses and brush around homes and at the edge of lawns.
- Place a 3-ft wide barrier of wood chips or gravel between lawns and wooded areas and around patios and play equipment. This will restrict tick migration into recreational areas.
- Mow the lawn frequently and keep leaves raked.
- Stack wood neatly and in a dry area (discourages rodents that ticks feed on).
- Keep playground equipment, decks, and patios away from yard edges and trees and place them in a sunny location, if possible.
- Remove any old furniture, mattresses, or trash from the yard that may give ticks a place to hide.
- Refer to the Connecticut Agricultural Experiment Station's [Tick Management Handbook Cdc-pdf\[PDF – 84 pages\]External](#) for a comprehensive guide to preventing ticks and their bites through landscaping.

## **Apply Pesticides Outdoors to Control Ticks**

Use of acaricides (tick pesticides) can reduce the number of ticks in treated areas of your yard. However, you should not rely on spraying to reduce your risk of infection.

If you have concerns about applying acaricides:

- Check with local health officials about the best time to apply acaricide in your area.
- Identify rules and regulations related to pesticide application on residential properties (Environmental Protection Agency and your state determine the availability of pesticides).
- Consider using a professional pesticide company to apply pesticides at your home.

Page last reviewed: February 22, 2019

- Content source: [Centers for Disease Control and Prevention](#), [National Center for Emerging and Zoonotic Infectious Diseases \(NCEZID\)](#), [Division of Vector-Borne Diseases \(DVBD\)](#)

# PREVENTION RESEARCH

## **Tick research:**

This has been the most underfunded field of science, yet it holds the most potential to bring about fruitful solutions.

## **Spreading like wildfire:**

Lyme and the Black Legged tick used to be a local CT problem, however in 40+ years is now in 50% of counties in the US. This does not include the other TBDs and ticks.

**Until tick research is funded this scourge of diseases and ticks will continue to spread like wildfire, infecting us our children, our pets, the reservoirs of disease, and wildlife.**

## **TICK RESEARCH and NOVEL APPROACHES**

Vaccine for Reservoirs (Mice, Chipmunks, etc.) – Bait, transgenic mice

Vaccines: Anti Tick Vaccine to block pathogen transmission to reservoir animals and humans

Nootkatone -

Acaricide + pheromone => minuscule safe targeted acaricide

Fungus

Natural predators of ticks (wolf spiders, Hunterellus hookeri wasp, ? )

Wolbachia

Transgenic ticks: Sex selection, Sterile eggs, Block pathogen transmission, ?

RNAi

Tick Microbiome

????



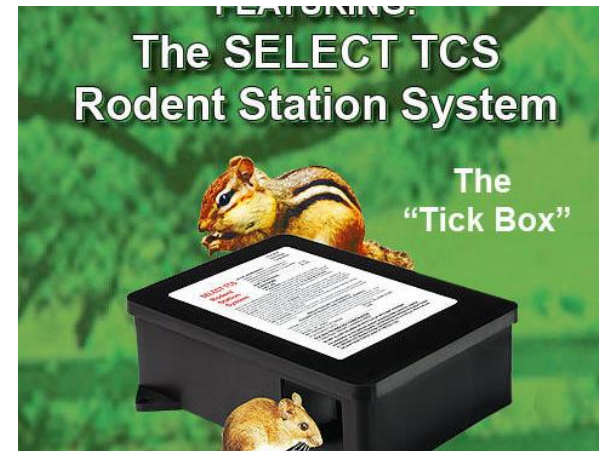
# TICK REDUCTION



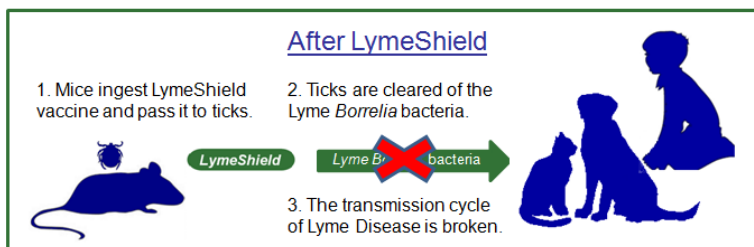
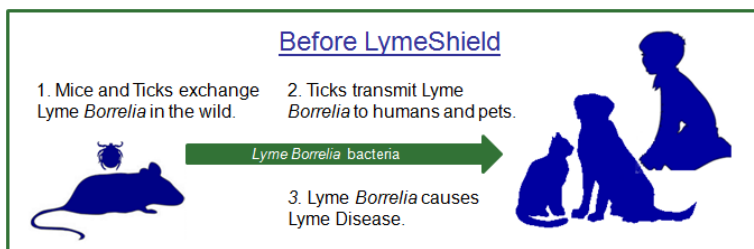
**Untreated vs Treated  
reduce billions of ticks from hatching**



**Low, controlled spray kills ticks**

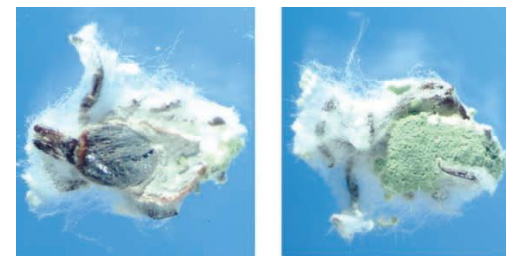


**kills ticks on mice**



### Tick Bait Vaccine

A disease prevention platform that can address multiple diseases



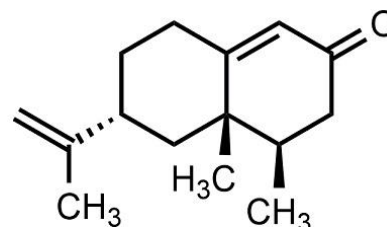
Natural fungus kills ticks



Cotton Balls to Nest Kills Ticks



Tick Bot



(+)-nootkatone

Grapefruit, Alaska Yellow Cedar



Cull Deer Herds

# TICK REDUCTION



# BLOCK TRANSMISSION OF TICK BORNE DISEASES

The Most Promising Field of Science to Produce Solutions Ignored

Receives a Pittance in Funding – Time to Prioritize

## Lack of Funding for **Anti-tick vaccine**

Ticks would not remain attached.

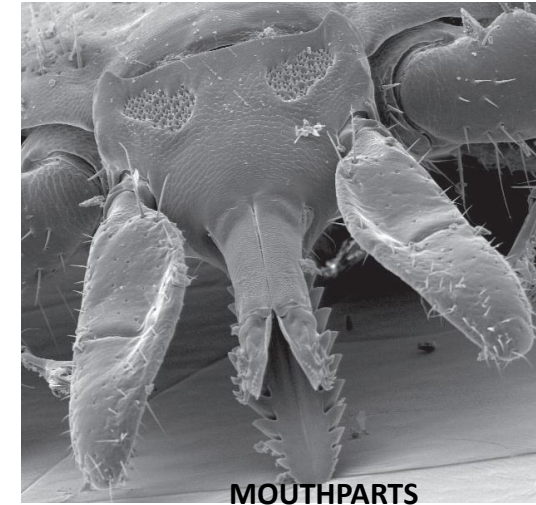
Prevent ticks ability to transmit all or almost all  
disease organisms to humans.

Bio-warfare threat

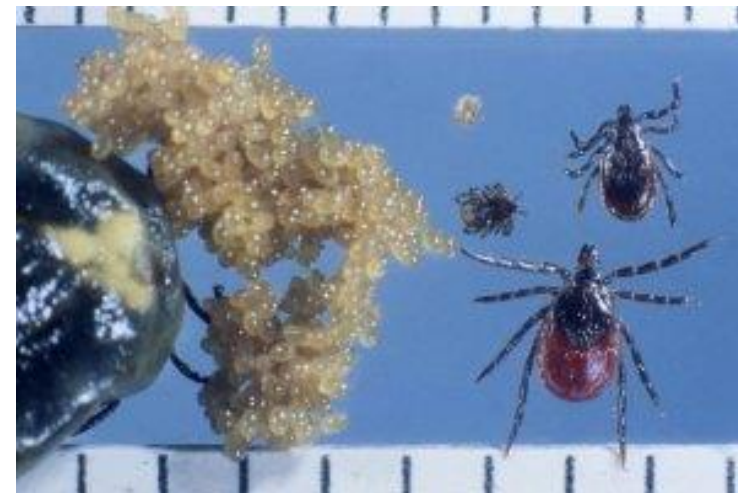
Armed services also interested to protect  
troops

**NIH discontinued funding, OUCH!**

No common sense; penny wise, pound foolish!



MOUTHPARTS



FEMALE LAYS EGGS, LARVAE, NYMPH ADULTS: FEMALE & MALE

Understanding the  
environmental tick problem.



**MATING**

*Ixodes scapularis* mating.  
Thanks to Jim Occi



**ADULT FEMALE PREFERRED HOST MATES ON DEER**



**DROPS OFF INTO BRUSH/LEAVES**



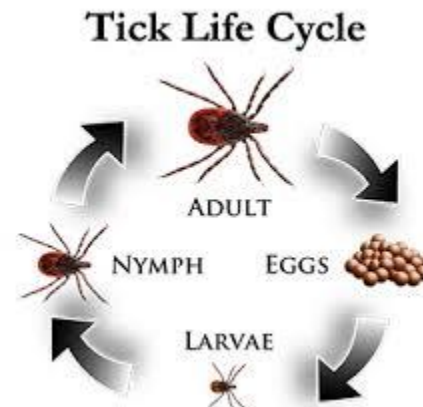
**TICKS TRANSMIT INFECTION TO US, & PETS**



## CYCLE OF DISEASE BEGINS IN NATURE



**LAYS 2,000-3,000 EGGS**



**LARVAL TICKS PICK UP INFECTION**



# Some Concerning Ticks in NYS

## What they look like

Ticks are very small

CDC @CDCgov · May 4

Ticks can be the size of a poppy seed. Can you spot all 5 ticks in this photo? Learn how to prevent tick bites. [bit.ly/2rjox6U](https://bit.ly/2rjox6U)



Invasive Asian Longhorned Nymph and Adult Tick  
Top View and Underside View – CDC  
New Invasive tick in NYS and 8 other states

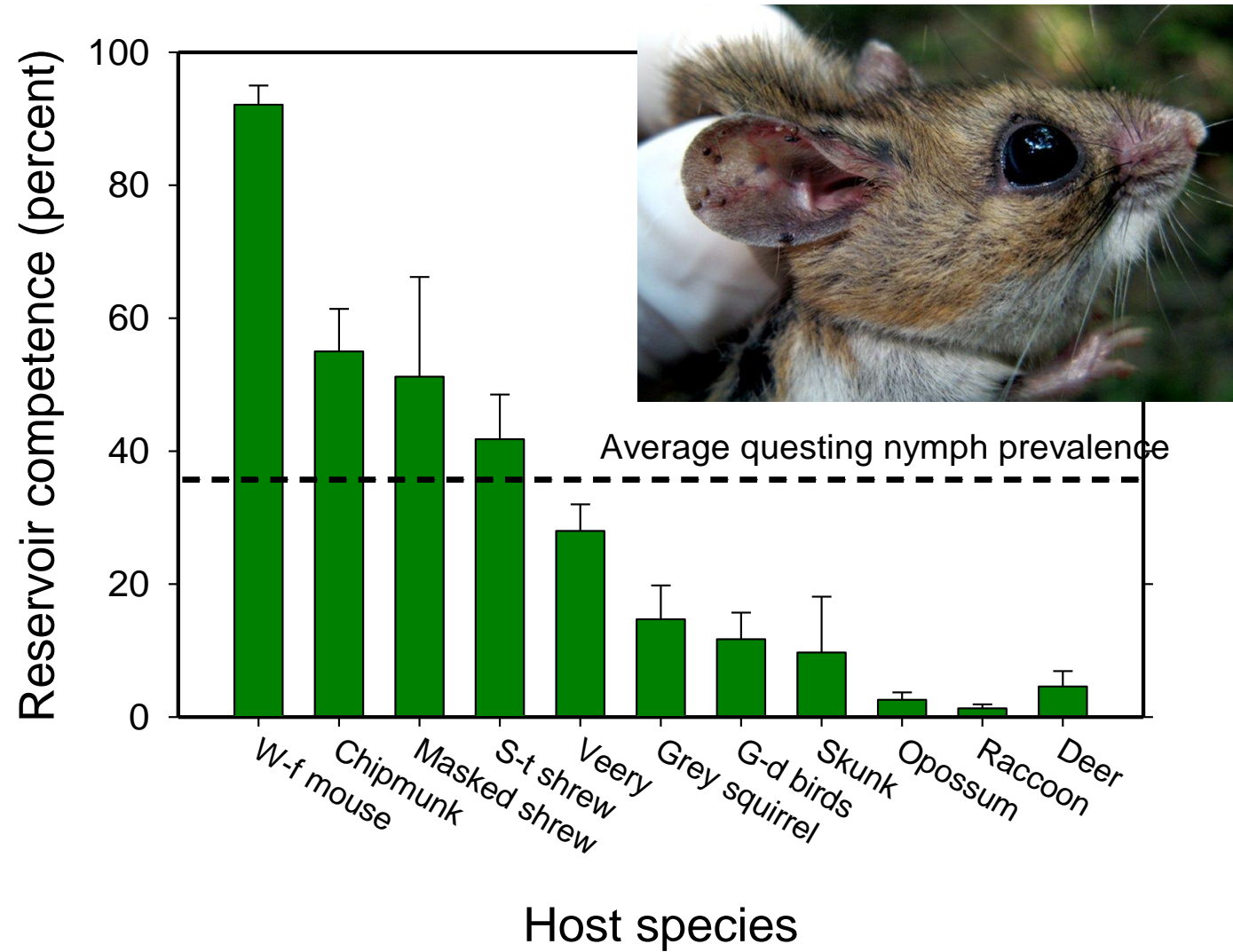
## Tick Drawings from CDC

Left to Right:

Adult Female, Adult Male, Nymph, Larva



**MOUSE MOST RESPONSIBLE**  
FOR SPREAD OF LYME, INFECTS THE TICKS  
and is a prime reservoir for other Tick-borne diseases





## ENVIRONMENTAL PROBLEM

No Resolution Until Scourge of Ticks are Addressed  
Protect Us, Pets, and Critters - From Ticks and Diseases





# An Environmental Problem

*Requires environmental solutions that are not harmful to us and the earth we live on.*

*The root causes, the TICKS and their reservoirs, must be addressed. Vaccinating the reservoirs is a real step in the right direction to stop the cycle of disease.*

*Humans are just a dead end in the cycle of progression of TBD. Human vaccination is temporary and does nothing toward a solution.*

*Without addressing the cause, the escalating diseases caused by tick pathogens will continue increasing, spreading and infecting us and other animals!"*

# **Tick Research to Eliminate Disease: Scientist Coalition (TRED)**

**The cause of Lyme and Tick-Borne Diseases is the TICKS and their reservoir animals in the environment.**

**In the past 43 years, Lyme disease alone has spread from the area surrounding Lyme, CT to at least 49% of all US counties!**

**Without addressing the TICK cause, the escalating voracious diseases caused by tick pathogens will continue increasing, spreading and infecting us and other animals!**

**Tick research which is the one field of science that holds the most promise in reducing TBDs has received the LEAST funding and recognition.**

**Tick Research is required to reduce tick populations and/or block tick ability to transmit disease pathogens to us!**

# So What Can Be Done

“Right now, prevention is the only thing in our bag to protect ourselves.

## Property and Personal Protection

### Research to STOP TICKS and STOP DISEASE

- Reduce Tick Populations
- Block Ability of Ticks to Transmit Disease

### Federal and State Legislation for all issues

# Prevention Websites 2019

Protect and Prevent Lyme and Tick-Borne Diseases

**USDA National Pest Alert:** Ticks and Tick-Borne Diseases

<https://www.ncipmc.org/action/alerts/ticks.pdf>

**Tick Encounter** by Thomas N. Mather, PhD, University of RI: [www.tickencounter.org/prevention](http://www.tickencounter.org/prevention)

How To Videos: [http://www.tickencounter.org/resources/how\\_to\\_videos](http://www.tickencounter.org/resources/how_to_videos)

How to Remove a Tick Video: <https://www.youtube.com/watch?v=1Vj-qhxCJbA>

Tick Spotters program: <http://www.tickencounter.org/tickspotters>

**Tick Management Handbook**” by Kirby C Stafford III, PhD CT Agricultural Station:

<https://portal.ct.gov/-/media/CAES/DOCUMENTS/Publications/ulletins/b1010.pdf.pdf?la=en>

**Tick Management Options Public IPM Working Group:**

<https://tickipmwg.files.wordpress.com/2018/10/tick-management-options-092018.pdf>

**CDC Stop Ticks:** <https://www.cdc.gov/features/stopticks/index.html>

**NYS DOH Lyme Disease and Other Diseases Carried by Ticks:**

<https://www.health.ny.gov/diseases/communicable/lyme/>

**Cornell IPM :** <https://nysipm.cornell.edu/whats-bugging-you/ticks/>

# Prevention Websites 2019

**EPA site of repellents:** (be certain to increase it to 100 views per page then there are about 7 pages – notice list is for ticks and mosquitoes. (DEET, picaridin, IR3535, Oil of Lemon Eucalyptus, or 2-undecanone)

[www.epa.gov/insect-repellents/find-insect-repellent-right-you](http://www.epa.gov/insect-repellents/find-insect-repellent-right-you)

**Some Websites for Permethrin Impregnated Clothing:** (there are many others as well including at some sporting goods stores) This is wise for children attending camp. After the first year, it might be wise to retreat the clothing with a permethrin spray

[www.insectshield.com](http://www.insectshield.com) - check where to buy.

[www.lymeez.com](http://www.lymeez.com) – gaiters

## **Tick Testing:**

TICKNOLOGY (report in 3 days): <https://www.ticknology.org/order.test>

## **Local Presentation and Information:**

<https://www.dutchessny.gov/Departments/County-Legislature/Tick-Task-Force.htm>

[www.nysenate.gov/newsroom/video/sue-serino/senator-serino-hosts-community-lyme-disease-forum](http://www.nysenate.gov/newsroom/video/sue-serino/senator-serino-hosts-community-lyme-disease-forum)

short: <http://hudsonvalleynewsnetwork.com/2015/07/01/senator-sue-serino-host-lyme-disease-forum/>

**Prevention, brief and simple:** calendar: area support groups: [www.stopticks.org](http://www.stopticks.org)

## **National Pesticide Information Center:**

<http://npic.orst.edu/> or call 1-800-858-7378 hours 7:30am-3:30pm PST

# The Cost Burden of Lyme Disease

## NYS and the US

# 2017 Cost of Lyme Disease in US

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**Annual Cases of US Lyme Disease** The CDC raised case estimates based on national survey data by a factor of 10X in 2013

Direct Medical Costs, Indirect Medical Costs, Lost Income, Lost Taxes, and Related Lyme Disease Costs Per Case as reported in the CDC's *Emerging Infectious Diseases* and adjusted for 2017 dollars.

Total Annual 2017  
US Cost Burden

437,430

X \$11,180

\$4,890,467,400

\*Source: Zhang, X., Meltzer, M.I., Pena, C.A., Hopkins, A.B., Wroth, L., and Fix, A.D. (2006) Economic Impact of Lyme Disease, *Emerging Infectious Diseases*, 12(4), 653 – 660. Adj. for inflation 2006 - 13

# 1990 -2017 Cost of Lyme Disease in US

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**1990-2017 Cases of US Lyme Disease** The CDC  
raised case estimates to 10x based on 2013 report

6,476,910

Direct Medical Costs, Indirect Medical Costs,  
Lost Income, Lost Taxes, and Related Lyme  
Disease Costs Per Case as reported in the  
CDC's *Emerging Infectious Diseases* and  
adjusted for 2017 dollars.

X \$11,180

Total 1990 - 2017  
US Cost Burden

\$72,411,853,800

\*Source: Zhang, X., Meltzer, M.I., Pena, C.A., Hopkins, A.B., Wroth, L., and Fix, A.D. (2006) Economic Impact of Lyme Disease, *Emerging Infectious Diseases*, 12(4), 653 – 660. Adj. for inflation 2006 - 13



# 2017 Cost of Lyme Disease in New York State

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NYS 2017 Reported Cases of Lyme Disease

Using NYS numbers and Centers Disease Control and Prevention raised case estimates based on national survey data by a factor of 10X in 2013.

98,030

Direct Medical Costs, Indirect Medical Costs, Lost Income, Lost Taxes, and Related Lyme Disease Costs Per Case as reported in the CDC's *Emerging Infectious Diseases* and adjusted for 2017 dollars. \*

X \$11,180

Total Annual 2017  
NYS Cost Burden

\$1,095,975,400

\*Source: Zhang, X., Meltzer, M.I., Pena, C.A., Hopkins, A.B., Wroth, L., and Fix, A.D. (2006) Economic Impact of Lyme Disease, *Emerging Infectious Diseases*, 12(4), 653 – 660. Adj. for inflation 2006 - 13)

# NYS VS CDC LYME NUMBERS FOR NYS

## CDC

- 2016 – 3882 X 10 = 38,820
- 2017 – 5155 X 10 = 51,550

## NYS

- 2016 – 7543 X 10 = 75,430
- 2017 – 9803 X 10 = 98,030

- The GREEN NYS actual cases are on the right. (The burden to the most endemic counties is reduced by including 100% of doctor reported cases plus 20% of laboratory reported cases. Using a NYS statistically proven mythology, these numbers are uplifted to 100% of the actual NYS cases.)
- The CDC only accepts the NYS actual laboratory cases (only 20% in endemic counties) plus doctor reported cases. These are shown in RED.
- The CDC is not permitted to accept the statistical data, only the actual reported numbers.
- The CDC numbers are a little over half of the NYS numbers.

NOTE: The 10X multiplier is based upon a 2013 CDC study published in 2013

# Chronic Illness is a Huge Cost Burden to Society

Chronic illness consumes **84% healthcare costs**. \*\*

## LD survey \*

- 79% productivity loss (work, school)
- 25% on disability
- most reported improvement with retreatment.

## Two NIH Human Studies

47% Lyme research patients had a duration of illness **>10 yrs**

\*Lorrane Johnson,JD, MBA "LD: Financial Burden of Illness

\*\*"Chronic Care:Making the Case For Ongoing Care 2010 Robert Wood Johnson Foundation

[www.rwjf.org/pr/product.jsp?id=50968](http://www.rwjf.org/pr/product.jsp?id=50968)

While case numbers went up, NIH funding for Lyme research did not

Disease	New cases (annual)	NIH funding
Hepatitis C 2012	1,300	\$112 million
West Nile Virus 2012	5,700	\$29 million
HIV/AIDS 2012	56,000	\$3 billion (11% total NIH budget)
Influenza 2012	73,000	\$251 million
<b>Lyme disease 2012</b>	<b>312,000</b>	<b>\$25 million</b>
<b>Lyme disease 2013</b>	<b>363,070</b>	<b>\$20 million</b>

“We won’t make progress until these dynamics change and without tests to diagnose and monitor Lyme and other tick-borne diseases. I have some trouble understanding how we could rapidly mobilize scientists to develop tests for MERS (Middle East Respiratory Syndrome), SARS (Severe acute respiratory syndrome), and Ebola, but have made little progress on Lyme over decades.”

Judy Stone, “Ticked Off – What we Don’t Know about Lyme Disease,” Forbes Magazine, June 2015

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**\*Lyme disease 2004    198,040    \$34.4 million**

## **CDC FUNDING**

- In the last two reported years (2016-2017), CDC Lyme case numbers increased, from 36,429 (364,290\*) to 42,743 (427,430\*).
- However, the 2020 CDC submitted budget for Lyme was cut almost by 12% to \$10.6 million.
- While, the 2020 budget request for Vector Borne Disease (VBD) remained the same, \$50.6 million.
- NOTE: Lyme alone has accounted for more than 75% of all VBDs.
- NOTE: All reported cases of Tick-Borne Diseases (TBD), increased in 2017.

\* 2013 CDC 10x estimated under reporting



## A 3 year old has 32 nymphal ticks removed after visiting a local park



Our only tick free park



